

REMARKS

I. Introduction

These remarks are being filed in response to the Office Action dated October 24, 2008. Claims 1-5, 8, 9, 11-15 and 17 are currently pending in this application. Claims 6, 7, 10 and 16 were previously cancelled.

For at least the following reasons this application should be allowed and the case passed to issue.

II. Claim Rejections under 35 U.S.C. § 103(a)

Claims 1-5, 8, 9 and 11-15 and 17 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kilb et al U.S. 2001/0016282 (Kilb) in view of Yanagihara et al., U.S. 5,543,250 (Yanagihara). Applicants respectfully disagree.

Claim 1, recites in pertinent part,

“[a]n alkaline storage battery comprising . . . (g) at least one current collector plate selected from the group consisting of (g1) a conductive current collector plate joined to the inner face of the bottom of said case and forming a path distributed two-dimensionally between the inner face of the bottom of said case and said first electrode for allowing a generated gas to transfer and (g2) a conductive current collector plate joined to the inner face of said sealing plate and forming a path distributed two-dimensionally between the inner face of said sealing plate and said second electrode for allowing a generated gas to transfer, said path including pores that communicate with one another and being formed of a part of said current collector plate,

wherein said current collector plate (g) comprises a conductive sheet having a **plurality of protrusions** and,

wherein said plurality of protrusions have tip ends that are buried in said first electrode or said second electrode.

[Emphasis added].

Similarly, claim 17 recites in pertinent part,

“[a]n alkaline storage battery comprising . . . g) at least one current collector plate selected from the group consisting of (g1) a conductive current collector plate joined to the inner face of the bottom of said case and forming a gap between the inner face of the bottom of said case and said first electrode and (g2) a conductive current collector plate joined to the inner face of said sealing plate and forming a gap between the inner face of said sealing plate and said second electrode, said gap including pores that communicate with one another and being formed of a part of said current collector plate,

wherein said current collector plate (g) comprises a conductive sheet having a **plurality of protrusions and,**
wherein said plurality of protrusions have tip ends that are buried in said first electrode or said second electrode.” [Emphasis added].

In order to establish a *prima facie* obviousness rejection under 35 U.S.C. § 103(a), basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must not be based on applicant’s disclosure. *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Further, “rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F. 3d 977, 988 (Fed. Cir. 2006). the legal conclusion of obviousness.” *In re Kahn*, 441 F. 3d 977, 988 (Fed. Cir. 2006).

At a minimum, the cited prior art does not disclose (expressly or inherently) a path or gap that includes “wherein said current collector plate (g) comprises a conductive sheet having a **plurality of protrusions and, wherein said plurality of protrusions have tip ends that are buried in said first electrode or said second electrode,**” as recited in independent claims 1 and 17.

For example, FIG. 1 of the instant disclosure, shows that a current collector plate (7) comprises a conductive sheet having a plurality of protrusions (8) and, wherein said plurality of protrusions (8) have tip ends that are buried in the first electrode (4) or said second electrode (5).

As shown in FIG. 1, the conductive sheet or current collector plate, (7) forms the gas transfer path (9), that is distributed at the whole interfacial area between the inner bottom face of the case (2), and the positive electrode (4). The gas transfer path, as claimed, provides high gas-transfer efficiency.

Furthermore, as shown in Table 9 of the present disclosure, the use of a current collector plate, including the pores as defined in the claims, improves gas-transfer, thereby resulting in a battery having excellent characteristics. (See specification page 41, lines 1-6).

The Examiner asserts on page 3 of the Office Action dated October 24, 2008, that the pores of the supports in Kilb would "inherently be in communication with each and with the gas transfer path." [*Sic*].

However, it is respectfully submitted that Kilb discloses a battery having a configuration with an electrode having an exposed metallic region which is free of active material, the metallic region being adjacent to the cell case, and a spring. Kilb further discloses that the electrode further has a central cut-off (a cavity). Kilb also teaches in paragraph [0022] that, the recesses (11) provided on a flat spring (7) arranged above the electrode, together with the cavity (10) arranged in the center of the electrode, ensures good gas exchange.

Moreover, the current collection structure of Kilb is formed in a different manner from that of the present subject matter. Kilb discloses in paragraph [0014] that, "according to the invention, the nickel foam support framework of the positive electrode 4 is designed such that the framework is free of positive active compound on the side which bears against the cell cup

11.” Furthermore, Kilb discloses in paragraph [0016] that “the negative electrode 5 likewise has as its support material a metal foam framework into which a hydrogen storage alloy has been pasted.”

In contrast, the subject matter of the instant claims, does not require the steps as disclosed by Kilb, in the formation of the instant current collection structure. Rather, the instant subject matter simply uses a *current collector plate*, which ensures that the pores are distributed across almost the entire interfacial area between the electrode and the bottom of the case or the inner face of the sealing plate, and thus ensures good current collecting performance.

Moreover, on page 4 of the Office Action dated October 24, 2008, the Examiner concedes that Kilb fails to teach that the support is punched metal or contains protrusions and therefore the disclosure of Yanagihara is relied on for allegedly teaching a storage battery having punched holes with burrs on their peripheries.

As previously discussed in the Response dated July 25, 2008, in contrast to the subject matter of claims 1 and 17, Yanagihara describes, a plate (1) buried in the electrode (4), hence, the holes of the metal support are **filled** with the electrode material as illustrated in FIGS. 5 and 6 of Yanagihara. In fact, Yanagihara describes “a filling of an active material being provided between the first and second metal layers with the punching burrs of the first and second metal layers, **the punching burrs being embedded in the active material.**” (See col. 2. lines 58-61). Therefore, Yanagihara clearly teaches away from providing any gas transfer pathway or gap. Indeed, in the pending Office Action dated October 24, 2008 the Examiner agreed that such a combination would destroy the base reference. See page 7 of Office Action dated October 24, 2008, “as that would destroy the base reference of Kilb et al. teaching the support being free of active material on the edge adjacent the outer case.”

Furthermore, if proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

As such, it is clear that a combination Yanagihara teaches away from any combination with Kilb.

In an attempt to overcome this clear teaching away of the combining Kilb and Yanagihara, the Examiner takes the position that the basis of the rejection is the combination of Kilb with only the current collector and not the entire electrode of Yanagihara. See Office Action dated October 24, 2008 at page 7.

As such, because, the Examiner asserts that the “combination as applied in the rejection does not teach embedding the entire current collector of Kilb in active material,” likewise, Applicants respectfully assert that there is no disclosure in Kilb that would serve as the basis to teach or suggest embedding only the tips ends of the protrusions of the current collector in the active material. As such, Applicants respectfully submit that the Examiner’s assertion appears to be a leap in logic that has no basis.

Moreover, the Examiner asserts that Yanagihara does not teach that the current collector is used in a wound battery, but rather only discloses a rectangular battery. However, it is respectfully submitted that, Yanagihara discloses in col. 5, line 47 to col. 6, line 10, that cylindrical batteries were fabricated using rectangular electrodes of 38 mm x 220 mm. As such, Applicants respectfully submit that a person having ordinary skill in the art would recognize that a battery having such an electrode configuration would be a wound type battery.

Therefore, neither Kilb nor Yanagihara, either alone or in combination teach or suggest that the current collector plate (g) comprises a conductive sheet having a plurality of protrusions

and, wherein the plurality of protrusions have tip ends that are buried in the first electrode or the second electrode and it would not be obvious to one having ordinary skill in the art to combine these two devices, as the references teach away from the proposed modifications.

Accordingly, claims 1 and 17 are allowable over the prior art.

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplicatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987).

Therefore, as independent claim 1 is patentable for the reasons set forth above, it is respectfully submitted that claims 2-5, 8, 9, 11-15, which are dependent on claim 1, are also patentable.

III. Conclusion

In view of the above amendments and remarks, Applicants respectfully submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

10/511,199

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP

Bernard P. Goff (Reg. No. 46,429)
Michael E. Fogarty
Registration No. 36,139

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 MEF:ASA
Facsimile: 202.756.8087
Date: January 26, 2009

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